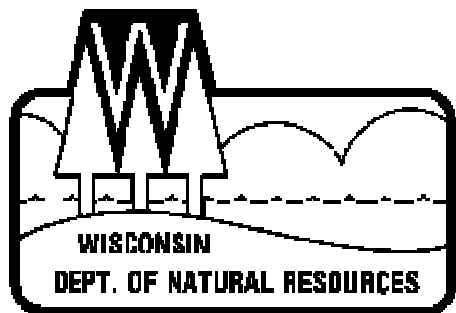
 <p><b>Pollution Prevention</b> Case Study</p>	<p style="text-align: center;"><b>Terry Printing</b></p> <p style="text-align: center;"><b>Reduction of VOC Emissions Through Substitution of Petroleum-based Inks With an Ink Derived from Soybeans</b></p>
<p><b>Standard Industrial Classification (SIC)</b></p>	<p>Commercial printing/2752</p>
<p><b>Type of Waste</b></p>	<p>Volatile Organic Compound (VOC) air emissions and non-hazardous solid waste</p>
<p><b>Strategy</b></p>	<p>Material Substitution</p>
<p><b>Company Background</b></p>	<p>Terry Printing, Inc. of Janesville is a family owned, full-service, commercial sheet-fed printer established over 50 years ago. The company produces instruction manuals, sell sheets, catalogs, brochures, annual reports, and greeting cards. The company currently employs 35 people on a full-time basis. In 1990 the company received the Governor's Award in Wisconsin for hazardous waste reduction.</p>
<p><b>Original Process</b></p>	<p>Petroleum-based inks were used in all of the company's printing operations.</p>
<p><b>Motivation</b></p>	<p>Terry Printing first became familiar with soy-based inks in the late 1980's through a Wisconsin advertising firm that inquired about soy ink. This advertising firm worked closely with agribusiness clients that sold soybeans and had heard of soy ink. The firm requested that its newsletter be printed with the soy ink. At that time it was virtually impossible to find a sheet-fed printer in the Midwest familiar with soy ink. Terry Printing contacted a developer of soy heat-set inks that was doing extensive lab work on soy inks for sheet-fed use. This resulted in the development of a soy ink with dry time and gloss (or rub) characteristics reported to be comparable to most conventional sheet-fed inks.</p>
<p><b>Pollution Prevention Process</b></p>	<p>In 1989 Terry Printing replaced its petroleum-based inks with a soy-based ink for use in all of its printing operations. Terry Printing was one of the first sheet-fed printers in the state of Wisconsin to use soy ink.</p>
<p><b>Material/Energy Balance</b></p>	<p>The ink manufacturer supplying the company has determined that the soy-based inks reduce ink VOC content and emissions by 65-85%. This reduction was determined by heating the formulation in a vacuum oven at 110 degrees centigrade for one hour and measuring the decrease in formulation weight (EPA method 24/ASTM method D-2369).</p>
<p><b>Economics</b></p>	<p><b>Capital Costs</b> The new ink did not require any purchases or conversions of equipment for adoption.</p> <p><b>Operation/Maintenance Costs</b> Terry Printing does not pay more for the soy ink than traditional petroleum-based inks. The company attributes this to the good relationship they have with their ink vendor.</p> <p><b>Payback Period</b></p>

	Not applicable.
<b>Benefits</b>	The benefits of using soy inks include reduction of VOC air emissions and easier and faster cleanup. Ink manufacturers are now producing the soy-based color and oil inks with non-toxic pigments and additives.
<b>Obstacles</b>	The major concern with the use of soy-based ink is with the longer drying time. Unlike newspaper inks that dry by absorption and evaporation, sheet-fed inks dry by oxidation. To address this problem, the ink supplier has developed a proprietary formulation of soy ink, petroleum oil, and dryers.
<b>Other Pollution Prevention Activities</b>	The company has implemented a paper recycling effort which has resulted in an estimated 80% reduction of paper and related solid wastes. Terry Printing uses recycled paper whenever possible and recycles all in-house paper (approximately 3 tons/week). Terry Printing is also recovering silver from negatives used in the printing process, thereby saving an estimated 6-10 ounces of silver for recycling every 6-8 months. The silver is acquired through a filtration system that contains magnetized brillo-like brushes that collect the silver and other heavy metals from the wastewater. Terry Printing uses aqueous plates (for the presses) made of environmentally benign materials. These aqueous plates and film are also recycled.
<b>Company Address</b>	Terry Printing, Inc. 1212 Plainfield Avenue Janesville, Wisconsin 53545
<b>Contact Person</b>	John Meyer, Director of Marketing & Sales 608/752-1517
<b>Additional Publications</b>	Publications on the printing and Publishing Industry are available from the Pollution Prevention Information Clearinghouse.
<b>Pollution Prevention Resources</b>	<p><b>Free, On-site Technical Assistance</b> University of Wisconsin Extension Solid and Hazardous Waste Education Center Milwaukee area: 414/475-2845 Remainder of state: 608/262-0385</p> <p><b>Pollution Prevention Information Clearinghouse</b> Wisconsin Department of Natural Resources Cooperative Environmental Assistance 608/267-9700 or e-mail: cea@dnr.state.wi.us</p>



**Bureau of Cooperative Environmental Assistance**  
**Wisconsin Department of Natural Resources**  
**P.O. Box 7921**  
**Madison, WI 53707**  
**608/267-9700**